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ABSTRACT

What can be done with a landscape besides just sitting back and enjoying it? The Lee County School Board's Landscape Playground Improvement Program, detailed within this document, was designed to enable school centers to improve aesthetic appearance, energy conservation, school climate, instructional opportunities, and community and school partnerships. The incentive program, while stressing the importance of native plant use for landscaping, fosters collaborative relationships among schools, district departments, businesses, and community agencies. The purpose of the Lee County Landscape/Playground Improvement Plan, as well as the advantages, design, and procedures for initiating a similar plan, are covered within this document. Suggestions for a budget process and for obtaining and planting native plants are included. Each school in Lee County has designed unique ways--specific to its school needs--to improve the school site; highlights of landscaping projects from schools across the county are included in a brief photographic sampler. A zone map and recommended vegetation, a plant hardiness chart, a list of toxic and hazardous plants of southwest Florida, suggestions for ponds and the school campus, and precautions for the use of toxic chemicals for school site improvement are appended. (KM)

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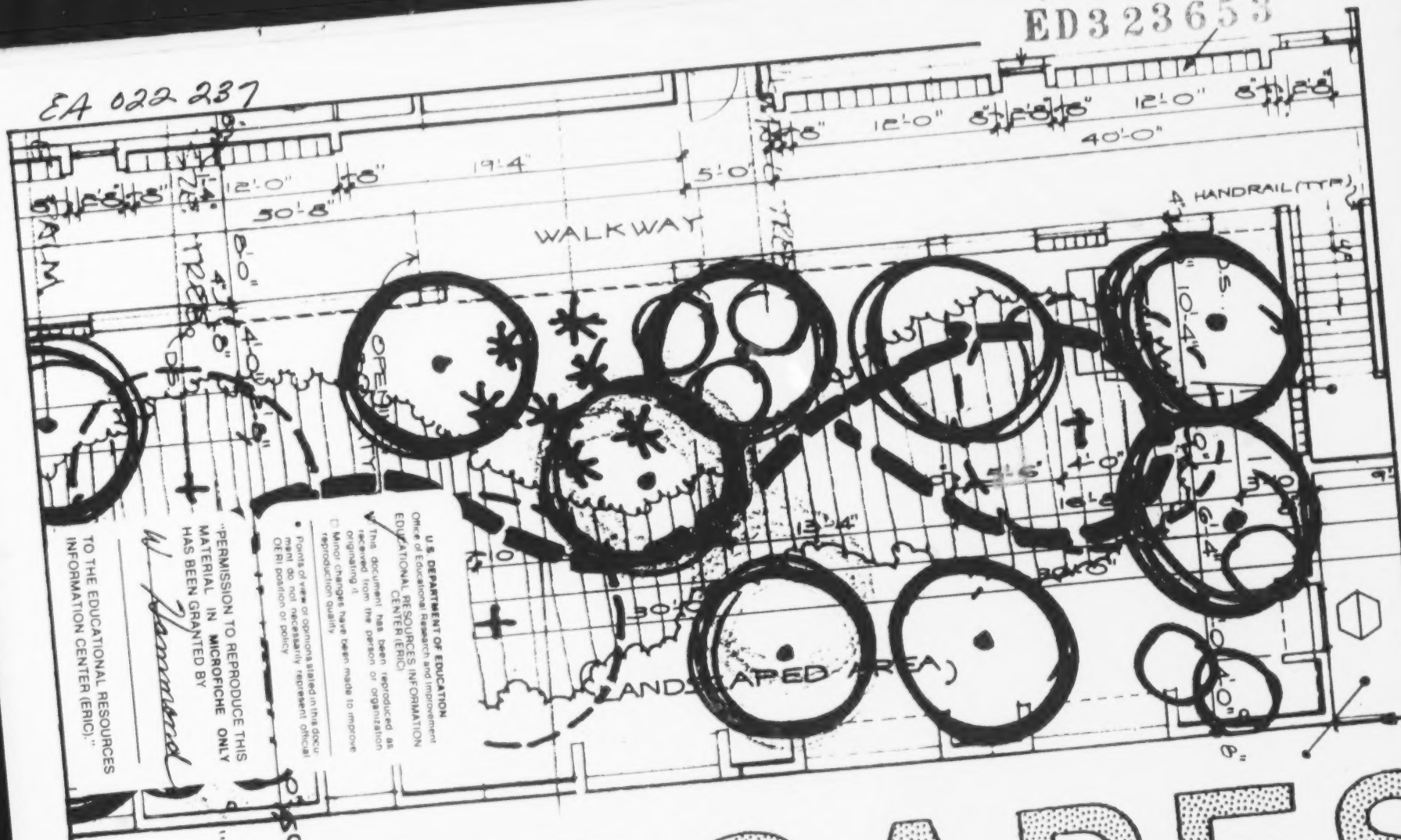

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LEESCAPES

School Campus Improvement Guide

Lee County Landscape/Playground Improvement Program

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October 28, 1986

Message from the Superintendent

From the time the School Board allocated funds to initiate the systemwide Landscape-Playground Improvement Project to the present, an amazing physical transformation has taken place in the Lee County School District. Because of the improved physical environment, school campuses are more conducive to learning, are more attractive and have become sources of pride for local school communities.

In every case the $1,000 allocated by the School Board has been matched with $1,000 from the local community. In many of the schools, the $1,000 seed money has generated as much as $2,000 to $3,000 and in one case, as much as $5,000.

Credit for the outstanding success of the program should be given to local school principals along with key members of their staffs, to involved community members who communicate their concern by getting involved and to the visionary leadership and expertise provided by Bill Hammond and staff from the Environmental Education and Instructional Development Services Department.

Sincerely,

James E. Melvin

JEM:mls

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A GROWTH PLAN

Many human minds have expressed the power and richness we gain from life when we work to grow things as an essential component of our human endeavor. Businessman S. Truett Cathy captures the spirit of our program with his thought,

"If you wish to enrich days,
plant flowers;
If you wish to enrich years,
plant trees;
If you wish to enrich eternity,
plant ideas and ideals
in the lives of others."

The Lee County Schools Landscape Program is an effort to attain each of these time bound objectives while bringing our daily practice into harmony with nature...for nature and wisdom do not differ. They are one in the same.

Bill Hammond, Director
Department of Instructional Development Services
and Environmental Education

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Purpose of the Landscape/Playground Improvement Program

The Lee County School Board's Landscape/Playground Improvement Program has been designed to enable school centers to improve aesthetic appearance, energy conservation, school climate, instructional opportunities, and community and school partnerships. The incentive program stresses the importance of using native plants for landscaping and fosters collaborative relationships between schools, district departments, businesses and community agencies. These collaborative relationships will improve design, development, and maintenance of district school sites. The Division of Facilities and Transportation, the Division of Business Services, the Department of Instructional Development Services and Environmental Education, and the Lee County Area Vocational-Technical School will work with architects to coordinate landscape/playground plans for school renovations and new school construction. An effective and efficient maintenance design for landscaping and site development will be the result of these efforts. Departments and divisions will aid schools to implement plans through a landscape/playground improvement "matching funds" program established by the School Board. The district will expand its capacity to provide school centers with technical assistance and services through the addition of support, equipment, expanded nursery operation, and a systematic means of receiving community donations of valuable plants and other materials.

Advantages of the

Landscape/Playground Improvement Program

The advantages of a well planned school landscape and playground are many. A carefully planned program will:

1. increase community and school pride in a facility that is attractive and well maintained, allowing a variety of activities.

2. assure "fitting" the best planting groups to each unique school site or specific location on the site in a systematic, effective manner.

3. minimize the need for ongoing maintenance and the long-term costs for fertilizer, spray, pruning, irrigation, etc.

4. minimize energy costs for cooling buildings by reducing heat loading on walls.

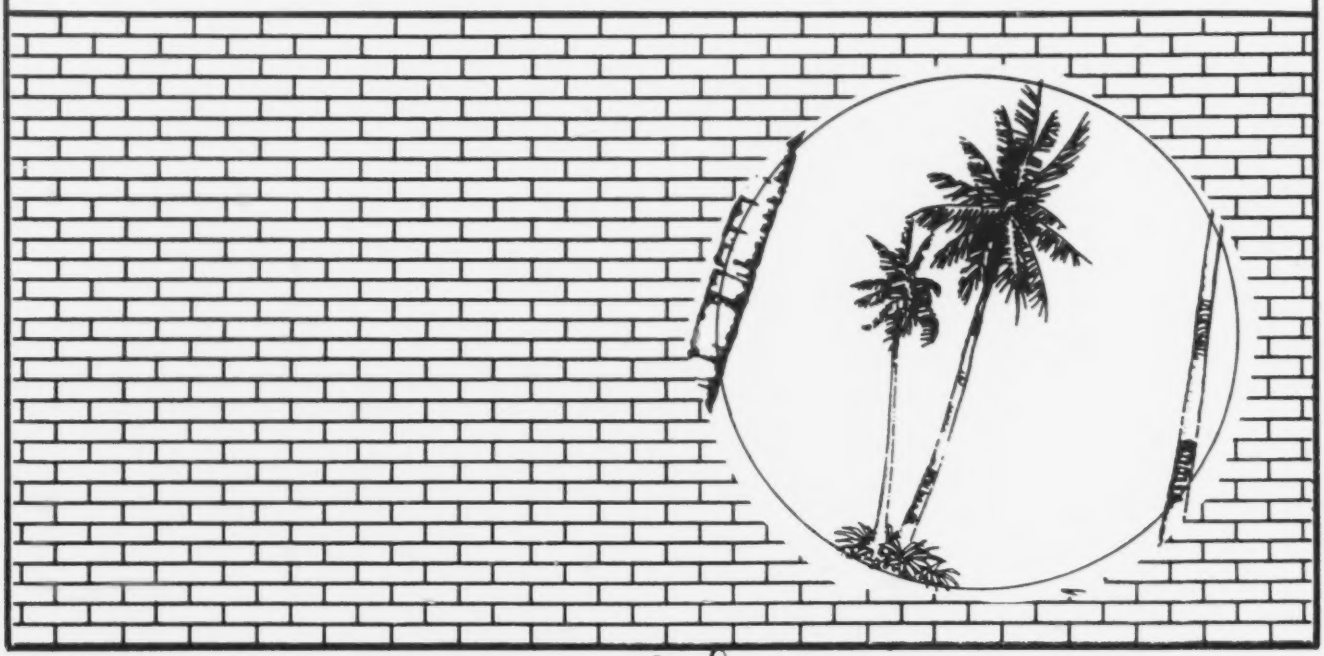
5. allow the school campus to be used as an additional instructional resource for stimulating learning in all subject areas.

6. provide an opportunity to establish an environmentally sound model for using and conserving Lee County's natural resources.

7. establish "managed" wildlife habitats (sources of food, water, shelter for wildlife) in a rapidly urbanizing area.

8. eliminate or minimize plantings which pose health and safety hazards.

9. provide an opportunity and incentive for all schools to work toward implementation of the "new schools'" education specifications site criteria.



Procedures For Initiating the Landscape/Playground Improvement Program

The school landscape/playground improvement committee is the key to long-term decision making and continuity of program implementation at your school. It has been found effective to ask "Who should be included?" when establishing membership on the committee. The following personnel should be considered when answering the question.

- Principal
- Assistant principal/administrative assistant
- Custodian/building supervisor
- Community advisory council members, P.T.A., or other interested family members
- Middle and high school level:
  - science department head
  - social studies department head
  - math department head
  - language arts department head
  - P.E. coaches
  - other interested teachers
- Elementary level:
  - grade level chairpersons
  - P.E. teacher
  - other interested teachers
- Student council members or other student representatives
- Outside personnel (to serve as resources):
  - Department of Instructional Development Services and Environmental Education staff
  - Rodney Smith - Nursery Operations, Lee Vo-Tech
  - Steve Cook - Director of Facilities Planning
  - District Landscape Technical Advisory Council (See member list in Appendix.)

This committee and the school's landscape plan have proven to be the critical link in maintaining continuity as principals and staff change at a school. The committee should focus on achievable projects. What do you want to accomplish in this phase and in your next phase? Make definite assignments to committee members, providing assistance as needed for a particular task. Improving the landscaped and playground areas of an entire schoolground is a very large task. Work in steps so that you can see the results of your efforts as your work proceeds. Involve the students and the community in the project as much as you can. Many hands make light work, and pride of ownership is one of the greatest ways you have to promote long-term care of your new landscape.

Flowchart for Landscape/Playground Improvement Program

PHASE ONE

Establish School Landscape/Playground Improvement Committee

Recommended people for committee:
- principal
- assistant principal
- custodian/building supervisor
- community members
- interested teachers
- P. E. coaches
- parents
- students

Conduct site assessment and inventory of present/future needs.

FACILITIES PLANNING

Mr. Steve Cook, Director
- blueprints
- growth plans
- utility lines
- etc.

PHASE TWO

Design a 3-5 year phased landscape/playground improvement plan.

Submit plan to Department of Instructional Development Services and Environmental Education for review and recommendation. IDSEE passes approved plan on to Budget Department.

INSTRUCTIONAL DEVELOPMENT SERVICES AND ENVIRONMENTAL EDUCATION
Mr. William Hammond, Director

FACILITIES AND TRANSPORTATION
Mr. Donald Hawkins,
Assistant Superintendent

BUSINESS SERVICES
Dr. Tom Benner,
Assistant Superintendent

PHASE THREE

Submit school matching funds to the Budget Department to establish an account from which funds may be drawn using purchase orders.

BUDGET DEPARTMENT

Mr. James Buckley, Director

Obtain plant stock, edging materials, mulch, etc.

MAINTENANCE DEPARTMENT

Mr. James Browder, Director

LEE CO. AREA VO-TECH SCHOOL

Mr. Ronald Pentuik, Director
Mr. Rodney Smith,
Nursery Operations

PHASE FOUR

Install landscape.

- commercial landscaping...
- volunteer groups...
  - students
  - parents
  - teachers
  - community groups
- Maintenance Department...

PHASE FIVE

Care for landscape.

- school staff and students...
- county maintenance crews...

OPEN OUT THIS DIRECTION

Establishing a Landscape/Playground Improvement Program

1. Establish a landscape/playground improvement planning committee. (See Section Four for recommended individuals for this committee.)

2. Conduct a status survey and site assessment for the campus, taking into consideration existing site conditions, present campus uses, and future growth needs.

3. Develop a three to ten year phased landscape/playground improvement plan. The plan should include the specific objectives to be accomplished during the first phase of the project, the source of matching funds or in-kind services, and the personnel, equipment, and materials needed.

4. Submit plans for Phase One to the Department of Instructional Development Services and Environmental Education (IDSEE) for review and recommendations. Upon approval, IDSEE will forward the plans to the Budget Department.

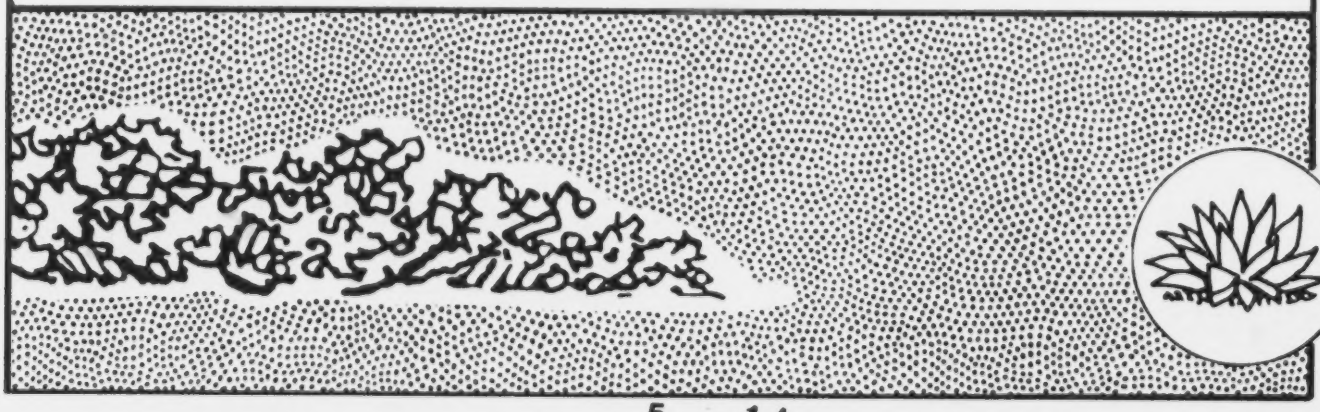
5. Submit money collected to the Budget Department to receive matching funds. An account will be established for your school's landscape/playground improvement plan. Purchase orders may be drawn on this account. (See Section Six for a more detailed discussion of the budget process.)

6. Order plant stock. This may be obtained from the variety of sources summarized in Section Seven.

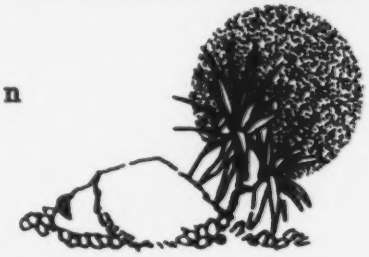
7. Plant your plants. Follow recommended guidelines for planting procedures as described in Section Nine.

8. Maintain your newly planted landscape with care as it becomes established. Obtain information about proper care for your new plants and trees from your source. For further information contact IDSEE or the Lee County Area Vo-Tech School Nursery Operation program.

The Department of Instructional Development Services and Environmental Education serves as the coordinating department for the district's landscape/playground improvement program and is ready to assist you throughout the design and implementation processes.



Design of the Landscape/Playground Plan



DESIGN CONSIDERATIONS

1. The landscape/playground plan should be designed as a series of phased projects to be completed over the next three to five years. Focus on a first phase which will have impact and be functional.

2. The landscape must have "curb appeal". First impressions of visiting people or just passers-by affect the way the public views and responds to the school. Positive first impressions usually form the basis for good relations. Create an attractive mix of textures and colors with your landscape. A school which looks good and feels good to work in or visit will convey a positive image.

3. Decide whether the existing landscape should be expanded or whether campus needs have changed and the old vegetation should be altered, removed, or perhaps transplanted to other sites on the campus in larger community groupings.

4. Discuss current needs for the campus. Considerations for P.E. and high energy game use, quiet tree/forest areas for science explorations, and space for investigation in social studies, art, math, language arts and other curriculum should be included in your plan.

5. Check site for high and low elevations and indicate clearly on the landscape plan where these areas are. Particularly note your low drainage areas where water may collect. Vegetation to be planted and the potential use of the areas should reflect these conditions. Maples, sweetgum, cypress, and dahoon holly will all do well in low-lying areas subject to occassional flooding. Pines and oaks prefer drier areas.

6. Look for diversity in planting and the potential for enhancing existing habitat around natural areas such as ditches or ponds. Check to see that "eyesores" such as dumpsters and air conditioners are concealed by vegetation. If not, include this consideration in the plan. Include areas just off the campus so that the school landscape blends with surrounding areas.

7. Plants having high water requirements, flowering plants, and non-natives should be placed next to the buildings and entrance where they can be used to focus attention and produce a pleasing appearance. Such areas will require considerable care and regular maintenance.

8. The landscape will have greater aesthetic and instructional value if it is planted in associated groupings rather than as isolated specimens. Contain these natural groupings in mulch beds as described in Section Nine.

9. The overall plan must meet maintenance constraints and requirements for mowing and long-term care. The following discussion on maintenance zones will help assure that these requirements will be met.

MAINTENANCE ZONES ON THE CAMPUS

Your landscape/playground plan should be designed around a series of zones established throughout the school campus. The Lee County Landscape Zone Map is a general guide for recommended species to plant in your area, based upon temperature, salt spray, and soil type (see Appendix). Within your school campus you should establish a series of maintenance zones as outlined below. These zones are established with consideration for water and fertilizer requirements, maintenance costs, aesthetic appeal, and educational value.

ZONE ONE - HIGH ENERGY - HIGH MAINTENANCE
landscaping in and around the immediate building which requires irrigation, fertilizers, pruning, etc.

ZONE TWO - MODERATE ENERGY - LOW MAINTENANCE
large, bordered and mulched natural community planting areas which have few maintenance requirements once established.

ZONE THREE - LOW ENERGY - VERY LOW MAINTENANCE
natural succession areas which will need little maintenance. Once delineated, these areas will be left in their "natural" state. A sign (available from IDSEE) should identify these areas as native plant succession study areas. Exotic species found growing in this area should be removed. After this, the area should remain a maintenance free, "no mow" area.

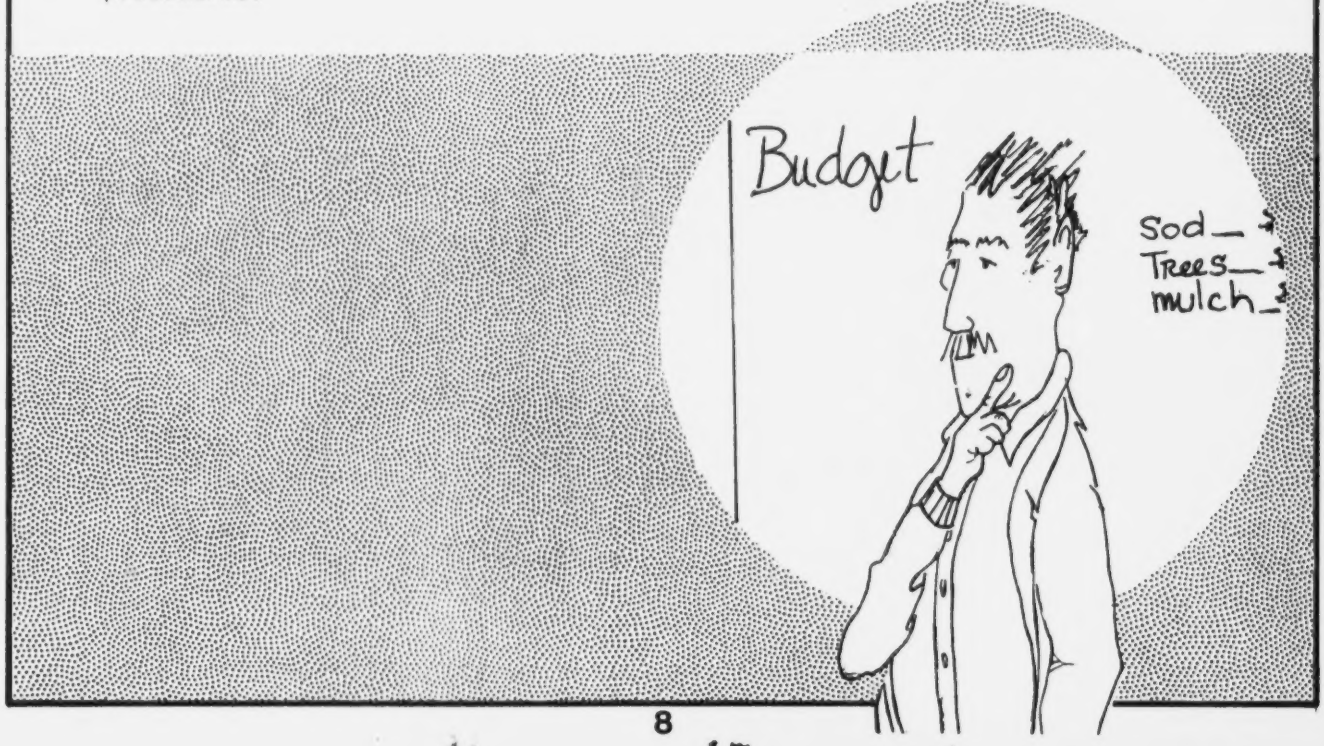
PLANT SELECTION HIGHEST PRIORITY - PLANT TREES

Included in the Apppendix of this guide are several resources to help you with your plant selection. Check the Lee County Landscape Zone Map to identify the zone in which your school is located. Consult the Recommended Vegetation list to see what plants will grow best in your zone. Select the plants you wish to include in your plan. Recheck all plants against the Toxic and Hazardous Plants list.

The Budget Process

The School Board will provide $1,000 in matching funds each year that a school submits a plan and raises $1,000 in landscape/playground improvement funds. The program, begun in 1985, is expected to continue through 1990. The school's landscape/playground improvement funds may be in the form of actual dollars to be turned in to the Budget Department. They may also be in the form of documented in-kind services (number of people, number of hours, estimated value of services, etc.), materials, or equipment as verified by letters of commitment from donors or in a written statement from the principal. The principal only needs to describe the budget summary (sources of funds and in-kind services) and landscape/playground improvement work to be accomplished in the current funding phase.

The school landscape plan and budget summary should be submitted by the principal to the Department of Instructional Development Services and Environmental Education (IDSEE) for review. IDSEE will then review the plan, with input from the Divisions of Business Services and Facilities Planning. The plan will be approved by memo notifying the Budget Department, the Maintenance Department, the Division of Facilities Planning, and the school principal of the plan's acceptance. If the plan is unacceptable for matching funds, IDSEE staff will work with the school principal and landscape/playground improvement committee to design a mutually acceptable plan. The approval memo will request that the school's cash contribution toward its matching funds requirement be forwarded to Mr. Buckley in the Budget Department. Mr. Buckley will establish the school's landscape/playground account and provide the school with budget numbers. The school may then purchase materials and services through regular purchasing procedures.



Obtaining Plants For Your School

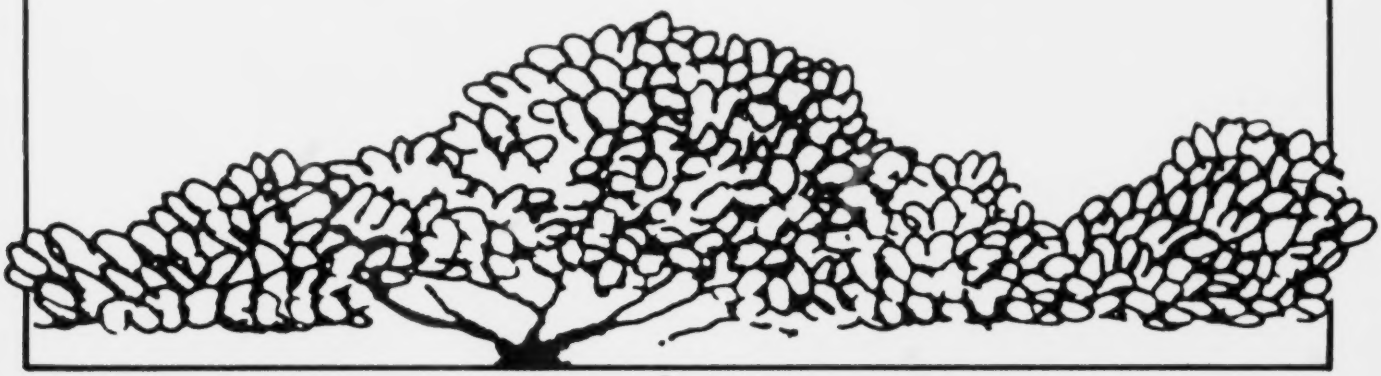
There are a number of ways for you to obtain plants and trees to include in your school's landscape/playground improvement plan. Remember that the priority should be given to purchasing or acquiring native plants. Check the Recommended Vegetation list and the Plant Hardiness Chart in the Appendix. There are many options for obtaining plants. You can:

1. Grow some of your own;
2. Purchase them from local nurseries;
3. Purchase them from Lee Vo-Tech;
4. Accept donations from parents/community that match your plan;
5. Transplant from other areas on your campus;
6. Purchase from the Division of Forestry.

Please contact the Department of Instructional Development Services and Environmental Education prior to purchasing any of your plant materials. Quite often IDSEE will be able to give you the latest price quotes from a variety of nurseries, tell you which source has the healthiest stock available, recommend the native plants most appropriate for your school campus, or suggest where you might find a particular species for which you are searching.

This year the Lee County Area Vocational-Technical School's Nursery Operation Program has expanded to stock a variety of native species being used on campuses across the county. This may be the best place to start when thinking of purchases. Another good place to look is the Lee County Association for Retarded Citizens' (LARC) nursery on Hanson Street. This nursery often has a good assortment of native plants.

By all means, seek community contributions. Be sure that the plant material donated is suitable for your school site and is on the list of recommended species. Also, keep in mind that purchases under $300 can be purchased from the best supplier for your school, but purchases over $300 require three phone quotes, and purchases over $1,000 require three written bids. (This is another good reason to call IDSEE before buying any plants for your landscape.)



Lee County Schools' District Plant Nursery

The Lee County School District has established a district plant nursery under the auspices of the Lee County Area Vocational-Technical School. While continuing retail sale of a wide range of plants at reasonable prices, expanded operations and facilities, begun in the summer of 1986, will emphasize the growth of native landscape plants for school use.

The first priority for the school district nursery will be to purchase and produce plant stock for the two new high schools now under construction. In the summer of 1987, the nursery will be planting major portions of the new high schools' landscapes.

The Vo-Tech horticultural class, under the guidance of Mr. Rodney Smith, will also design and implement landscape plans for new school additions. These landscape projects, when completed by the district nursery, will save the district many thousands of dollars in costs.

The district nursery will have a wide range of plants available for purchase by schools at production cost for landscape plan implementation.

The Vo-Tech horticultural class will also provide technical assistance to schools on the design and implementation of school landscape plans and maintenance techniques.

Planting Recommendations

1. When designing the landscape beds be sure to provide mower access to all grass areas.

2. Run a border of 1" x 4" or 1" x 6" pressure-treated boards, on edge, around the perimeter of all mulch beds to stop grass runners from entering the beds and to contain the mulch. Approximately 1" - 2" of the border should remain above the surface of the ground. Use gentle curves on corners of mulch beds, ones that can be negotiated by mowing machines (no less than a four foot radius).

3. Mulching the area under the trees will reduce water loss from the soil, prevent the growth of weeds in the beds, and will prevent damage to the tree bark from mowers and weed trimmers. Apply 1/2" thick sections of newspaper or a layer of black plastic over the area to be enclosed within the border. Newspaper allows water to penetrate into the soil and will kill the grass under the mulch if it is placed in a thick enough layer. It is also a good way to recycle newspapers. Don't skimp on paper. Cover the paper or plastic liner with at least 3 inches of tree bark mulch or pine needles. If you would like a more finished appearance, top off the rough tree bark mulch with melaleuca mulch or pine needles.

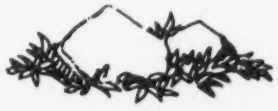
4. We strongly recommend "innoculating" your mulch beds with pine needles or oak leaf mulch obtained from areas where pines and oaks are growing. A couple of good-sized handfuls of well-decomposed mulch will do. This will provide your newly planted trees with the critical microorganisms and fungi they need to grow well.

5. Plant trees in habitat groupings rather than as isolated trees. This will reduce mowing time and lessen the chance of damage to trees from mowing accidents as well as provide a more pleasing appearance.

Determine the appropriate plant communities for your habitat site. The most widely used habitat groupings for Lee County are pine flatwoods, hardwood hammocks, swampy areas, and pond/creek/canal areas.

a. Pine flatwoods

canopy trees - Florida slash pine, live oaks
shrubs - saw palmetto, wax myrtle, gallberry, runner oaks, rusty lyonia, tar flower, and salt myrtle
ground cover - bracken fern, paw paw, pennyroyal, butterfly weed, cardinal flower, yellow milkwort, coreopsis, and beggar-ticks



b. Hardwood hammock (moist area)

canopy trees - maples, sweet gum, laurel oaks, loblolly bay, bald cypress, cabbage (sable) palm, strangler fig, dahoon holly and Florida elm
shrubs - marlberry, myrsine, hog plum, wild coffee, primrose willow, and wax myrtle
ground cover - marsh pinks, hatpins, loosestrife, climbing hemp, string lily, blue flag iris, midsoris fern and Boston fern

c. Swampy areas

canopy trees - cypress, popash, pond apple, coastal plain willow, red maple, Florida elm, dahoon holly, and strangler fig
shrubs - primrose willow and buttonbush
ground cover - arrowhead, marsh fern (wet), midsoris fern (drier), pickerel weed, blue flag iris, and wild Boston fern (on logs)

d. Pond/creek/canal areas

canopy trees - cypress, red maple, pond apple, and laurel oaks (around perimeter)
shrubs and emerging plants - cattails, blue flag iris, pickerel weed, and Juncus
floating plants - water lily, bladderwort, Myriophyllum, Salvinia, Azolla, duckweed, Elodea, Nuphar (spatterdock), Nymphaea (yellow water lily) and Ludwigia

6. Whenever possible, use native plants rather than exotics. Natives are generally more hardy, need less water, and require less maintenance than most exotics.

7. Use the recommended plants for your zone. Frost sensitive plants may grow well in one area of the county and suffer severe damage elsewhere. Consult the Lee County Schools Landscape Zone Map and the Recommended Vegetation list for plants that will do well in your area.

8. Try to buy larger trees rather than smaller ones if the money is available. Often a few large trees are preferable to many small ones.

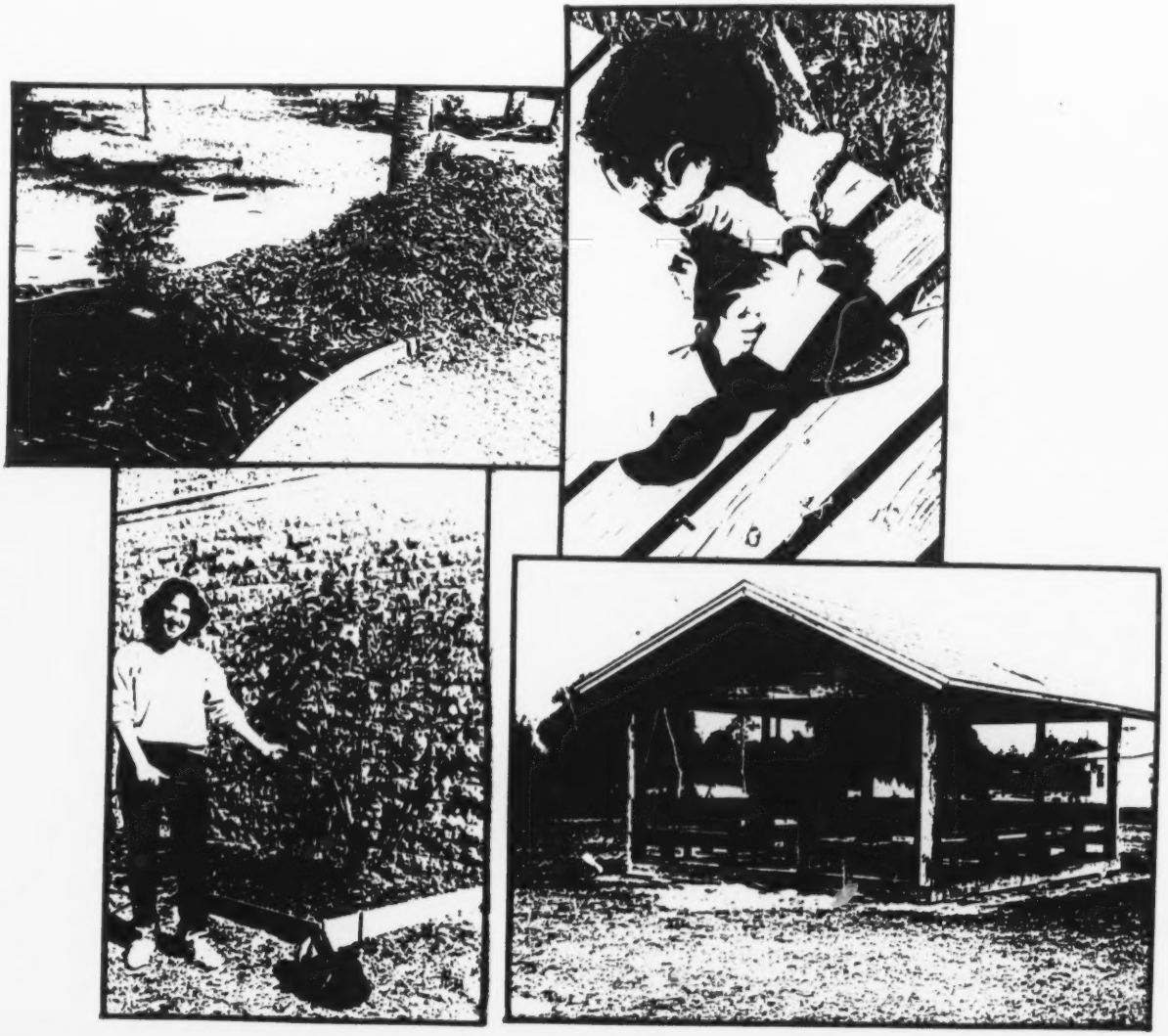
9. Work in phases so that the task of planting and maintaining is not overwhelming. Great landscapes don't happen overnight!

10. Each school should raise funds to install a well if one is not currently in use. The well will irrigate the school's maintenance area. The Maintenance Department will assist you in the well planning and permit process. Water costs will continue to rise, making watering a major expense for the landscaping budget. Watering should occur during the night or early morning when less water is lost through evaporation and wind drift.

Model Landscape/Playground Improvement Programs

Each school has designed unique ways, specific to its school needs, to improve the school site. A brief sampler of projects from schools across the county is included in the following section. Some of the projects were completed using funds from the district's Landscape/Playground Improvement Program. Other projects were the results of Environmental Education Mini-Grant funds.

One of the Landscape/Playground Improvement Program's goals is that each school should create an attractive landscape that has "curb appeal". Success in attaining this goal has varied considerably, but all school sites are improving.



Tropic Isles Elementary School

The landscape program at Tropic Isles Elementary School has proven to be a near perfect model. The steps followed by Principal Connie Jones and the landscape/playground improvement committee are as follows:

1. A committee composed of administrators, teachers, custodians, children and parents, and community members was established. This blend was considered necessary for the success of the project; it ensured that all school groups, including the students, viewed themselves as part owners in the landscape adventure.

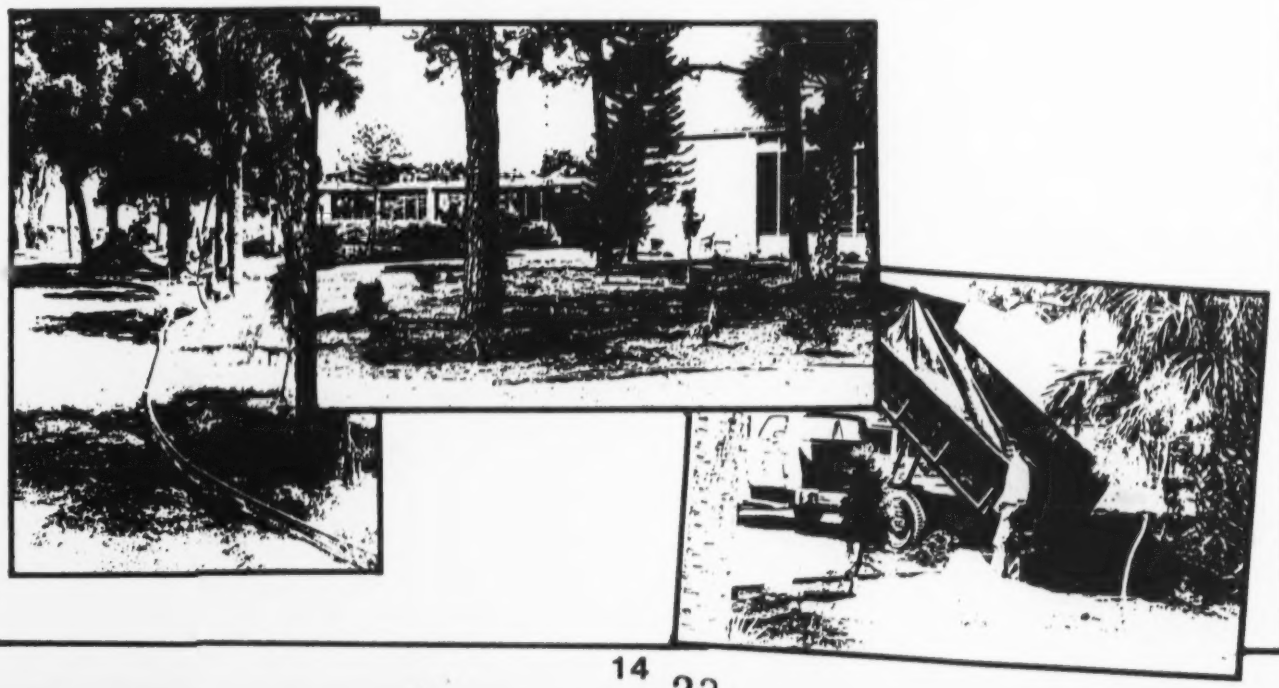
2. The landscape committee, assisted by the services of a professional landscape architect, designed a school plan. (Other schools have relied upon the talents of their staff or asked IDSEE for assistance.)

3. Upon approval of the plan, an IDSEE staff person and landscape volunteers laid out the habitat beds and marked the location of individual plants.

4. A Saturday work day was held and all plants that had been purchased or donated were placed in their designated locations. Each mulch bed was designed and constructed in accordance with maintenance requirements and recommended guidelines. (See Sections Five and Nine.)

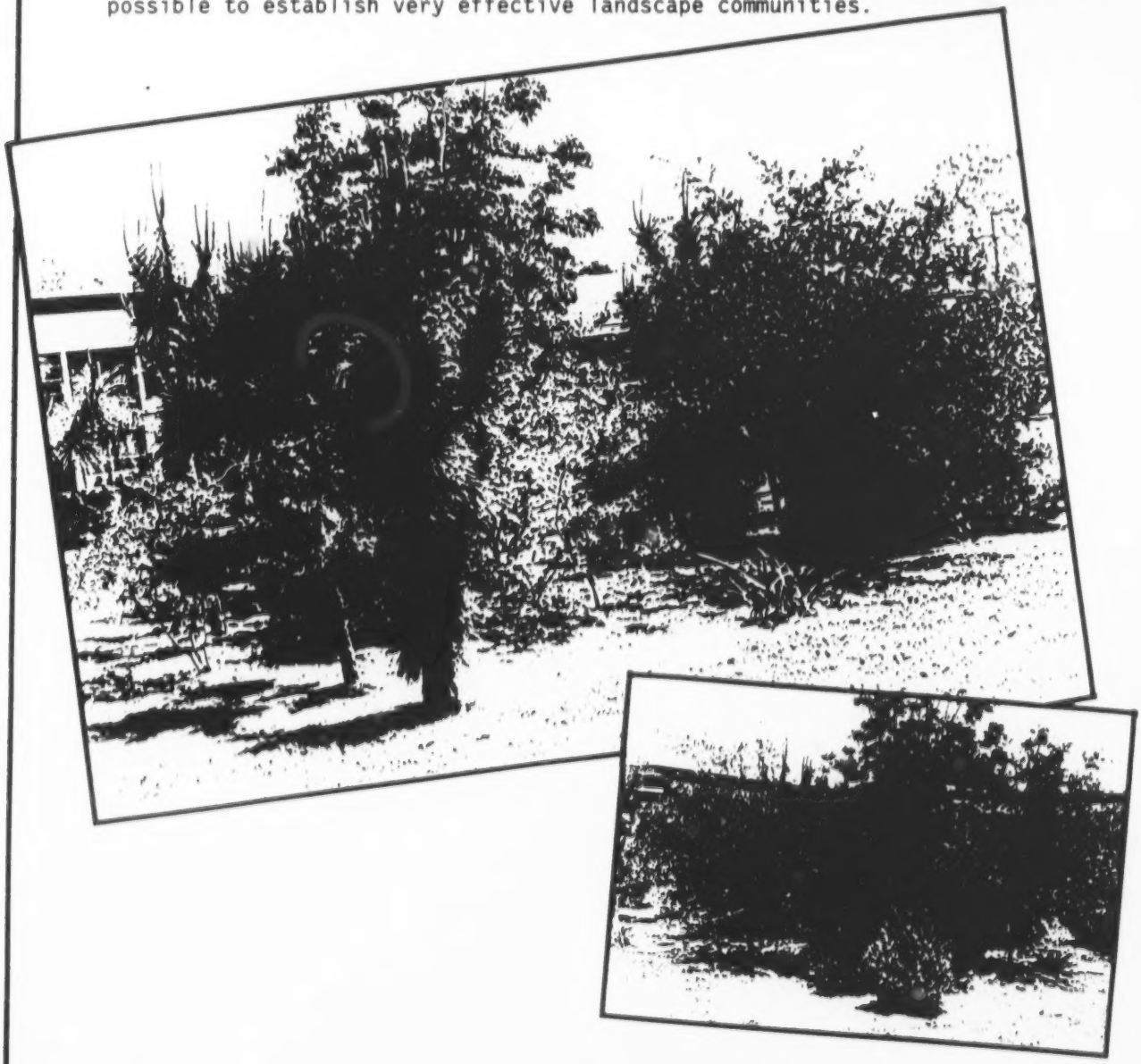
5. Colorful ground cover plants such as beach sunflower, blue daze, and gailardia were placed in the entranceway beds, drawing the viewers' attention through the outlying landscapes to the central walkway.

6. Each class planted the small beds near their classroom.



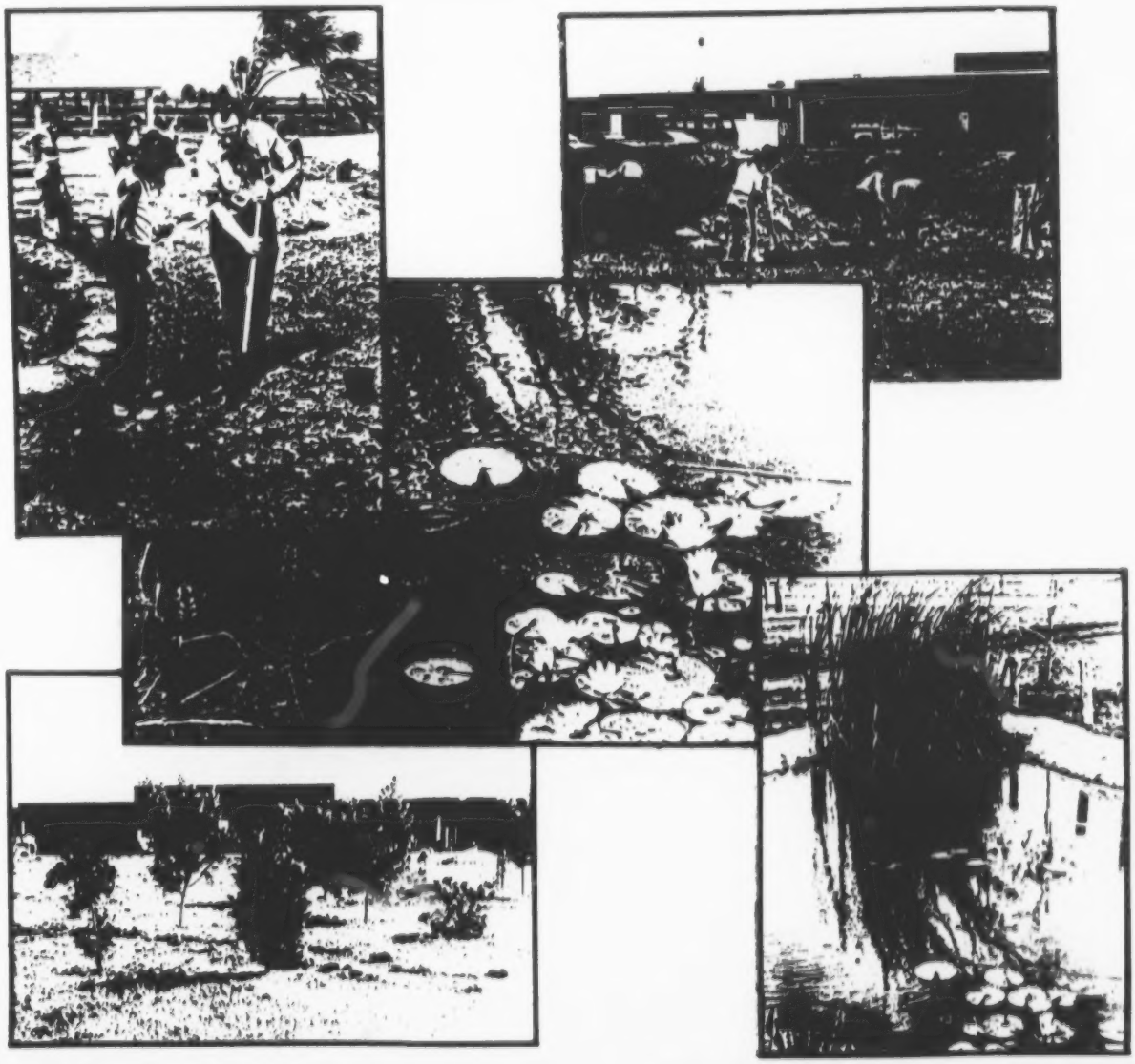
Cape Elementary School

Cape Elementary was very fortunate to have the assistance of Cape Coral Parks Nursery Manager Ms. Tracy Ryan. Ms. Ryan has had a tremendous effect upon the landscape of several Cape Coral schools as well as the landscape of the entire community. She believes in habitat planting of native plants and heavy pine needle mulching in order to conserve Cape Coral's ever-decreasing water supplies. Cape Elementary's small native plant restoration project is clear evidence that even on the barren, high pH soils of Cape Coral, it is possible to establish very effective landscape communities.



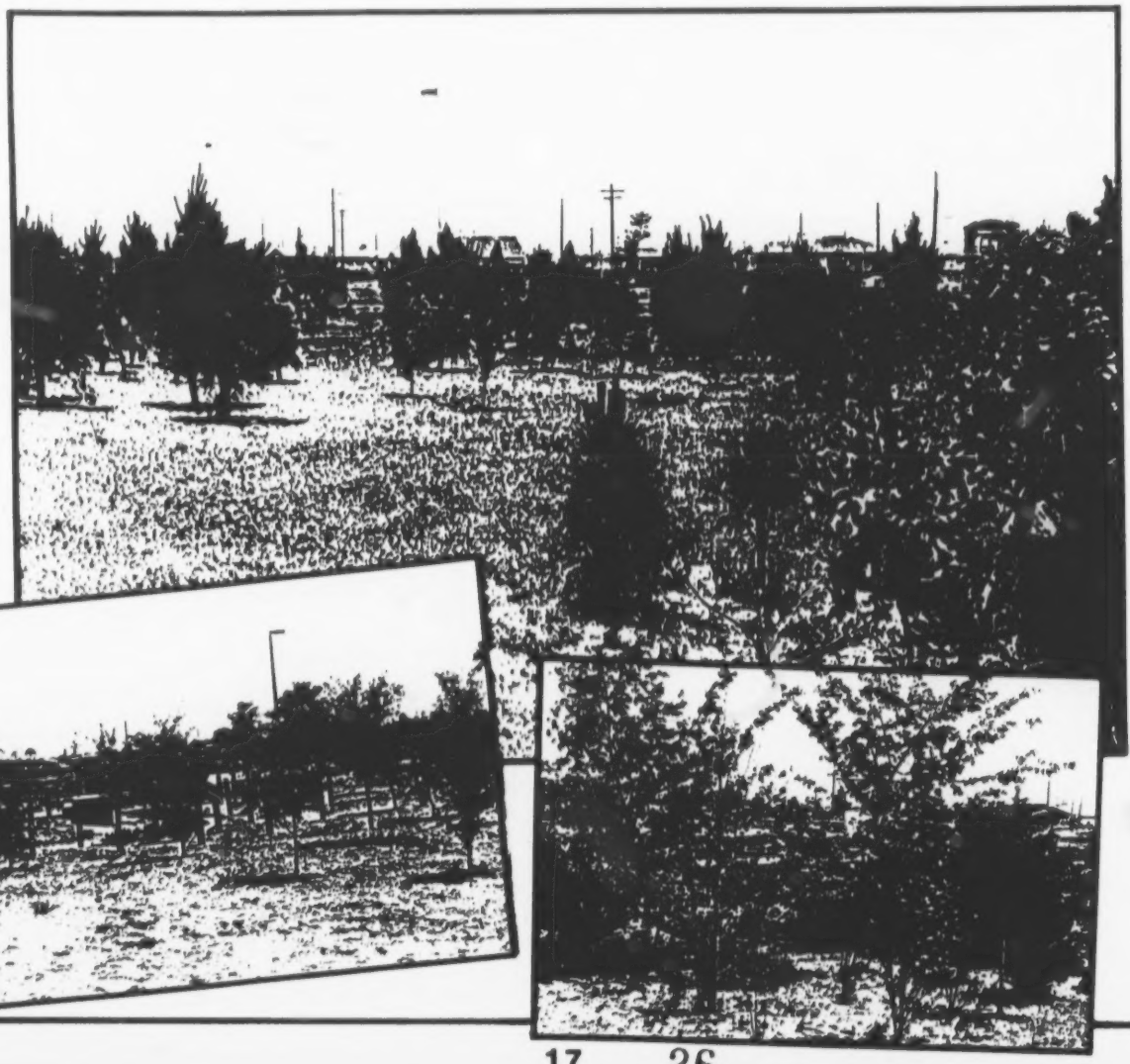
Caloosa Elementary School

Funds from a state Environmental Education Mini-Grant were used by teacher Kyra Spry to start Caloosa Elementary School's outdoor study area. A nature trail, complete with a cement pond aquatic study area graces the western side of the building. State Division of Forestry seedlings were planted by classes under the supervision of Valerie LaPlante and IDSEE staff. Oaks, pines, and maples were planted into habitat goupings with abundant mulch applied to reduce weed growth and water requirements. Much of the credit for keeping the plants healthy must go to the excellent custodians who spent many hours making sure that the young trees got a good start.



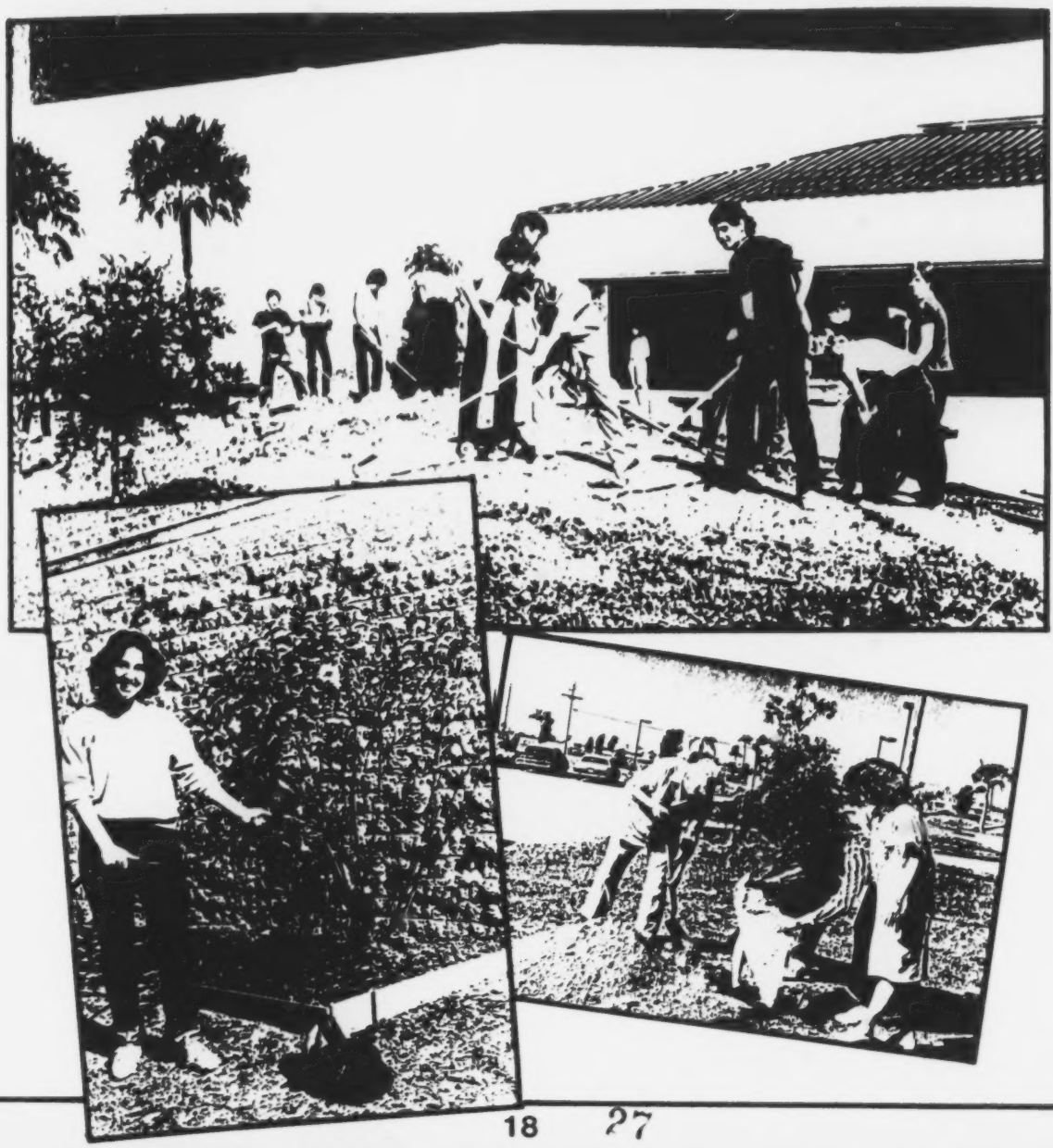
Pelican Elementary School

Project Walden, initiated by Mrs. Karen Norris at Pelican Elementary, serves as a model to schools planning for long term results and those that wish to change their campus into a useable, aesthetic, outdoor classroom. Pelican Elementary was faced with an unusable, unsightly area when the portable classrooms were removed from the campus. Mrs. Norris wrote a state Environmental Education Mini-Grant to receive funds to build a cement pond study area, extend a watering system, create gardening plots for all classes, and purchase native landscaping material. The project was planned in phases, and the results after a four year period were astounding. Now that the trees are taller than the students, phase two understory planting will begin. A small piece of Cape Coral will again experience a rejuvenation of native plant communities. Parents, community members, children, and the school staff were all part of the team that produced this beautiful native study area.



Cape Coral High School

Tracy Ryan's outstanding leadership and horticultural abilities have been put to good use by Cape Coral retiree Joe Stamas in his quest to see Cape Coral return to its previous forested state. Joe helped Cape Coral High School students plant some of Tracy's beautiful oak and maple trees around the school's entranceway. The responsibility of the school system is to assure our community supporters that these valuable trees will be properly fertilized, pruned, and mulched.



Gulf Middle School

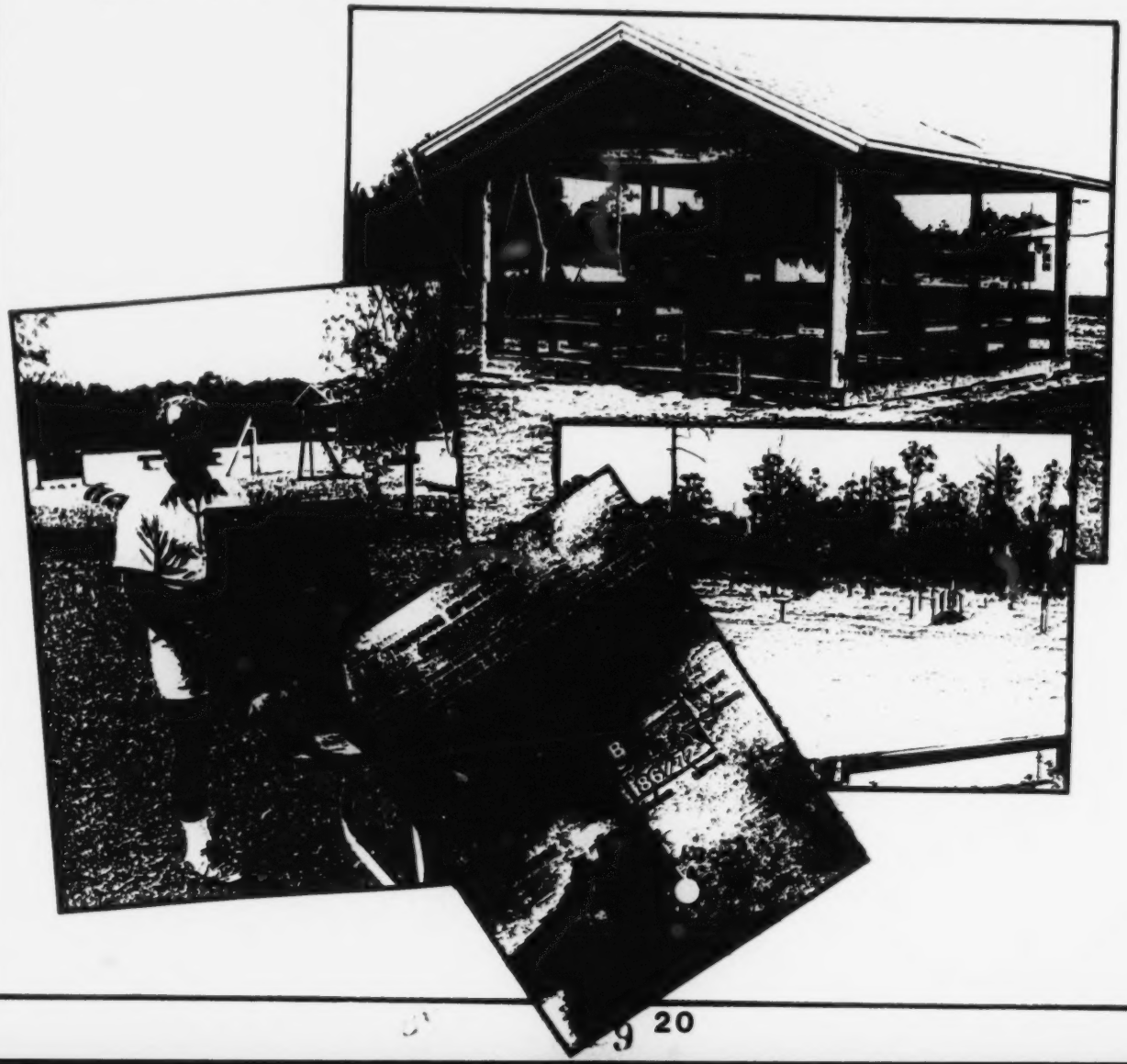
Environmental Education Mini-Grant funds, money raised by the school, and labor provided by the IDSEE Basic Environmental Science Seminar were the ingredients necessary to provide Dr. Polly Timberlake's Gulf Middle School campus with two fine boardwalks and aquatic study decks. Students are journaling, studying natural history, and obtaining aquatic specimens without having to change into boots or "swamping" clothes. The Environmental Science Seminar was also involved in helping to build the Project Adventure low course at the school. The high elements of the course were built by IDSEE and Project Adventure staff members.

Orange River Elementary School

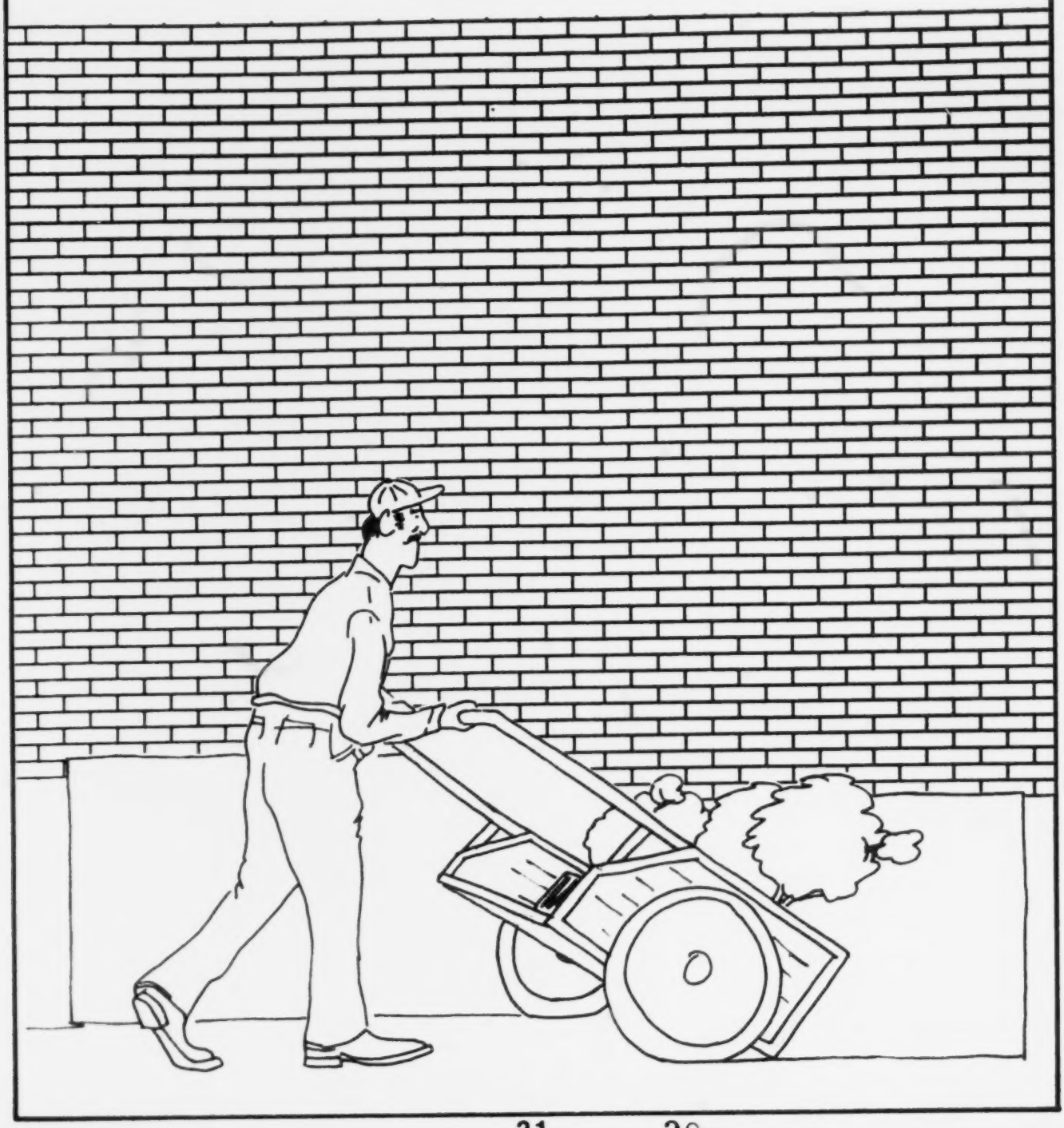
Gulf Elementary School

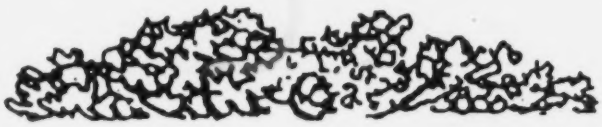
Two other campuses have been effectively modified for instructional purposes, thanks to the efforts of P.E. teacher Dennis Snyder and media specialist Allison Lutz. Dennis Snyder is responsible for a tremendous tree planting project, an outdoor shelter, and a superb orienteering and natural history course at Orange River Elementary School.

Allison Lutz, at Gulf Elementary School, has designed a nature study area complete with weather stations, soil samplers, garden plots, bird feeders, and animal track stations. A greenhouse is also being planned for this area. The labor for this project will be supplied by the IDSEE Basic Environmental Science Seminar and by the excellent Gulf Elementary custodians at the school who have built most of the projects for this dynamic nature study area.



Using the School Landscape for Instructional Activities





Landscape - what can you do with it besides just sit back and enjoy it? As a result of your landscape plan, your school campus has been enhanced with an array of wonderfully self-maintaining native and low-maintanance plants which can serve as low-cost, highly exciting educational tools. As students and parents involved in the process, you have stimulated and gained an awareness about plants and their uses for conserving energy and creating aesthetically pleasing settings. Using natives and low-maintanace plants demonstrates energy savings and energy efficiency. Students can gather information themselves that will "prove" native plants are less energy consumptive than exotic plants. They can learn to identify plants and understand their contributions to other living things on the earth. Students can also learn about giving "tours" or taking visitors on guided walks.

The process of developing a plan and planting trees and shrubs on the school campus can stimulate class discussions about plants, people, and wildlife sharing the same needs for life. The following is a list of simple activities which can help begin the learning process shared and inspired by plants and people living together.

1. Classes of students can work together on a school-wide project to develop a "Guide to Our School Campus" . Students should go out onto the school campus and identify, then interview different types of plants, animals and other objects on the campus. After the interviews, students can learn more about the plants in the school media center and write a page about the subject. Students can also draw pictures of their subjects. When all the students have completed their research and their reports, the information should be compiled in a booklet form to share with new students, teachers, visitors, and parents.

2. Plant Requirements - Review the three basic life requirements of plants: sunlight (food), water, and oxygen for the roots (carbon dioxide for the leaves). Have students survey the school campus for areas where plants do not grow. Determine which life requirements are missing for that particular area. (Bare ground on paths or playground sites can be related to soil compaction, which reduces the necessary amount of oxygen in the soil. Stress the importance of burrowing organisms and plant roots to loosen and aerate soils.)

3. Succession area - Find several of the same type of weeds on campus. Plaintains, ragweed, pennywort, lambsquarters, Spanish needles, etc. work well. Have students measure the height of the plants, record the number of branches, and make sketches of the plants. Have each group remove different leaves or branches from its plant. Tag the plants with waterproof markers so that they can be identified later. Have at least one group remove the terminal bud (growth area) of the plant. Make periodic checks on the plant

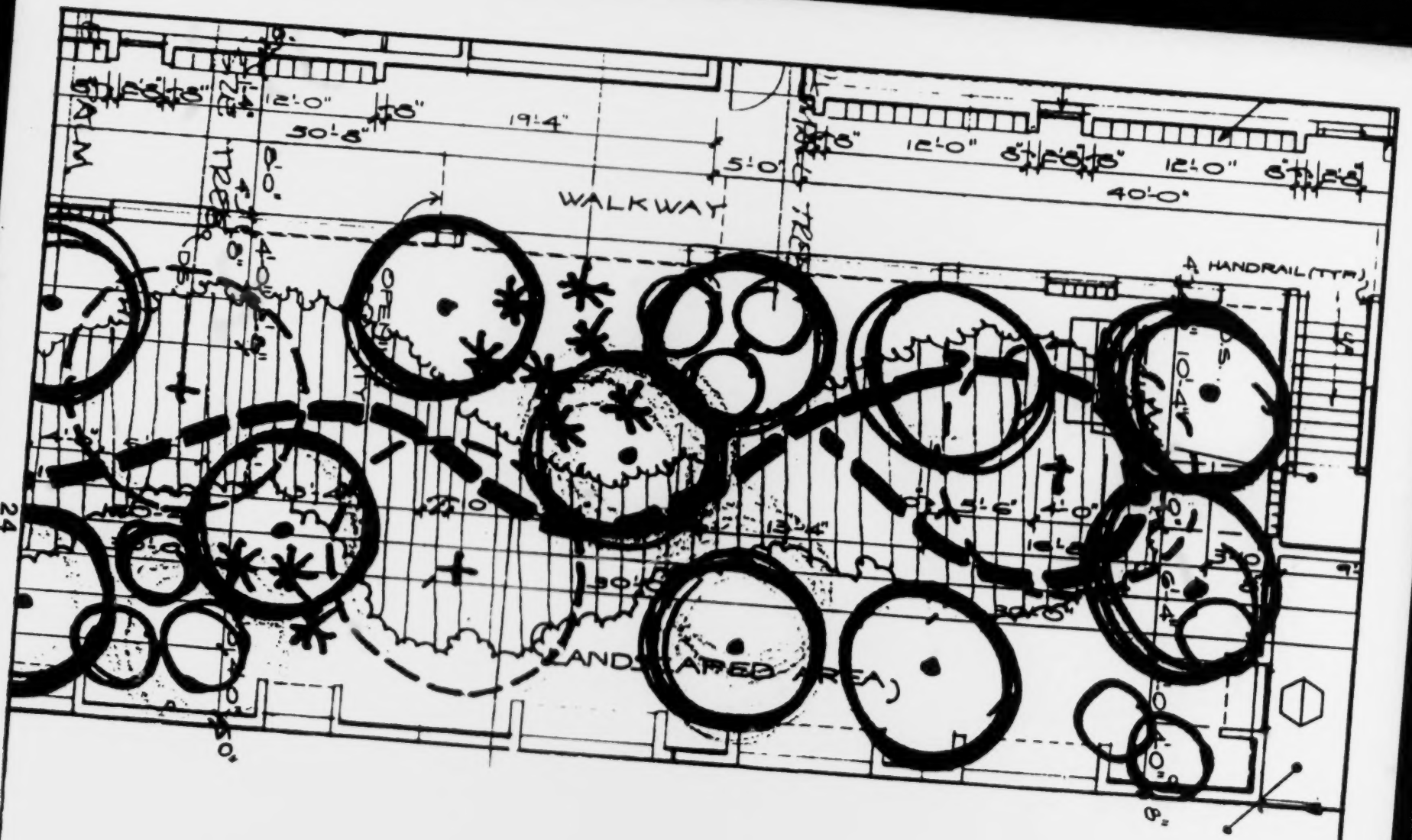
growth. How were the plants affected? Try to repeat the exercise and determine if these changes are predictable or occurred by chance only.

4. Plant respiration - To demonstrate plant respiration to your students take them outdoors to a tree or shrub on campus. Place a plastic bag around the tip of one branch and securely fasten the open end of the bag around the stem. Water drops will form on the inside of the bag. From where does the water come? Fasten bags to several different plants. Which ones produce the most water from respiration? Which ones would survive best in a dry climate?

5. Measuring leaf evaporation - Select a leaf on a tree and make a leaf sandwich of it by placing a layer of plastic wrap on the top and bottom of the leaf. DO NOT remove the leaf from the tree. Between the leaf and plastic wrap place a strip of cobalt blue paper. Hold the entire thing together with paper clips. Check the leaf periodically and record the time it takes for the cobalt chloride paper to turn from blue to pink (dry to wet). Try several leaf sandwiches. Compare different species of plants from different micro-communities - dry, wet, sunny, shade, north side of building, south side of building, etc. Record and list data.

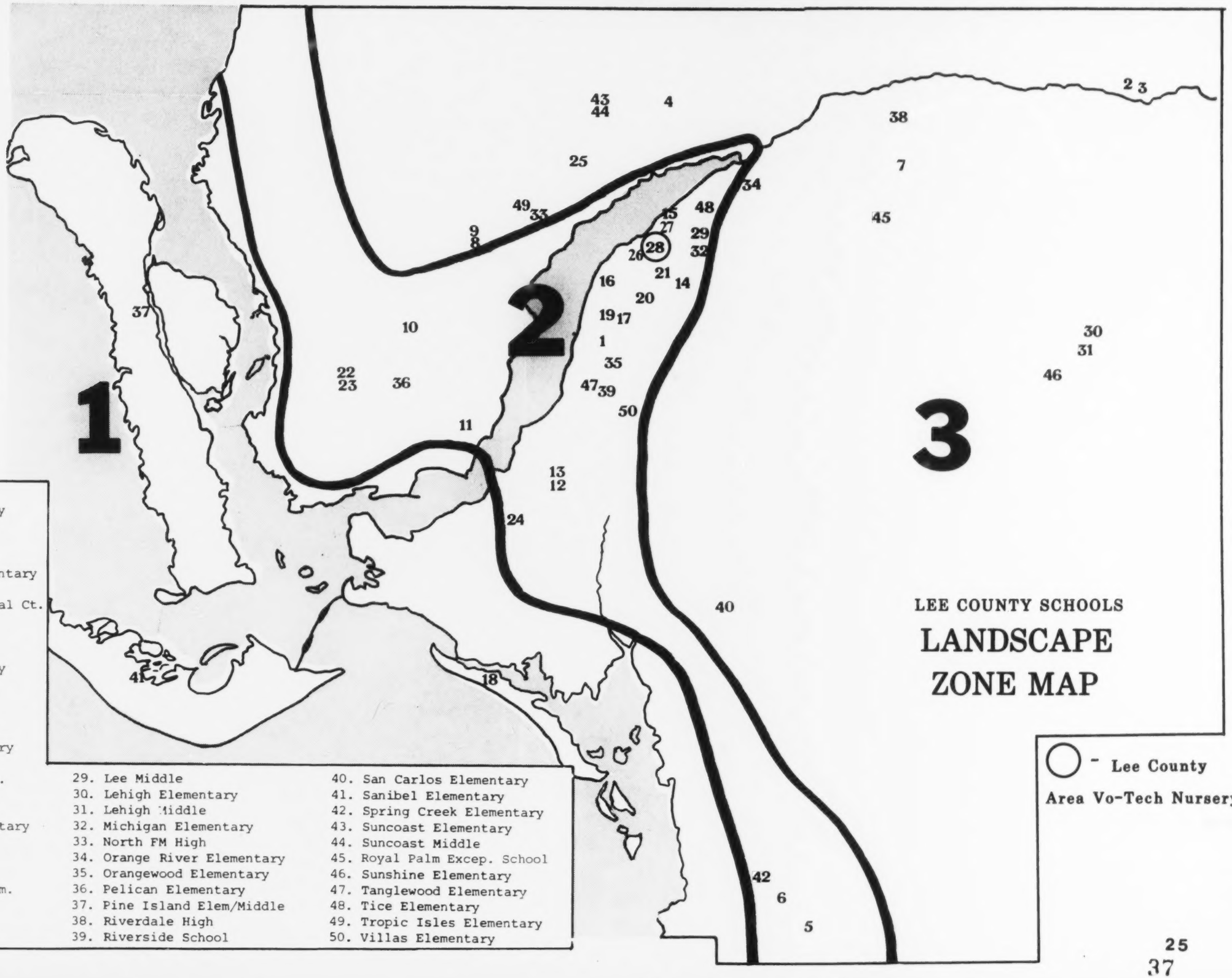
6. Collect seeds from plants found on campus. Divide the class into groups of four and give each group two or three types of seeds. The students should then go out on the campus and locate the plants that produce the seeds. This exercise will increase observation skills. A leaf from each plant can be collected and then matching seed and leaf can be taped to construction paper to make a bulletin board display.

7. Photographic stations - document change. Place a number of 4"x4"x5' high posts at key locations on your school site and each fall, winter and spring take a photograph from each of the post markers to document campus change. Create a photographic history of change on your campus.



APPENDIX

OPEN OUT THIS DIRECTION



#	School
1.	Allen Park Elementary
2.	Alva Elementary
3.	Alva Middle
4.	Bayshore Elementary
5.	Bonita Springs Elementary
6.	Bonita Middle
7.	Buckingham Exceptional Ct.
8.	Caloosa Elementary
9.	Caloosa Middle
10.	Cape Coral High
11.	Cape Coral Elementary
12.	Cypress Lake High
13.	Cypress Lake Middle
14.	Dunbar Middle
15.	Edgewood Elementary
16.	Edison Park Elementary
17.	FMHS Edison Center
18.	Ft. Myers Beach Elem.
19.	Fort Myers High
20.	Fort Myers Middle
21.	Franklin Park Elementary
22.	Gulf Elementary
23.	Gulf Middle
24.	Heights Elementary
25.	J. Colin English Elem.
26.	LAMP
27.	Lee County ALC
28.	Lee Area Vo-Tech
29.	Lee Middle
30.	Lehigh Elementary
31.	Lehigh Middle
32.	Michigan Elementary
33.	North FM High
34.	Orange River Elementary
35.	Orangewood Elementary
36.	Pelican Elementary
37.	Pine Island Elem/Middle
38.	Riverdale High
39.	Riverside School
40.	San Carlos Elementary
41.	Sanibel Elementary
42.	Spring Creek Elementary
43.	Suncoast Elementary
44.	Suncoast Middle
45.	Royal Palm Excep. School
46.	Sunshine Elementary
47.	Tanglewood Elementary
48.	Tice Elementary
49.	Tropic Isles Elementary
50.	Villas Elementary

LEE COUNTY SCHOOLS

LANDSCAPE ZONE MAP

○ - Lee County Area Vo-Tech Nursery

Recommended Vegetation — Landscape Zones

Zone One

TREES

Native:
- Sweet Acacia
- Black olive
- Green buttonwood
- Silver buttonwood
- Red cedar*
- Bald cypress*
- Dahoon holly*
- Geiger tree
- Gumbo limbo
- Mahogany
- Red maple*
- Laurel oak*
- Live oak*
- Slash pine*
- Sea grape
- Seaside mahoe
- Sweetgum
- Sycamore
- Wild tamarin
- Strangler fig
- Cabbage palm*
- Coconut palm
- Fla. silver palm
- Paurotis palm
- Royal palm*
- Myrsine

Exotic:
- Beach acacia
- Earleaf acacia
- Bottlebrush
- Eucalyptus
- Frangipani
- Golden rain tree
- Golden shower
- Jacaranda
- Orchid tree
- Royal poinciana
- Pongam
- Queen crape myrtle
- Tree of gold
- Areca Palm
- Canary Island date palm
- Chinese fan palm
- Fishtail palm
- Pygmy date palm
- Queen palm
- Senegal date palm
- Washingtonia palm

SHRUBS

Native:
- Cat's claw
- Cocoplum*
- Gallberry
- Lantana
- Marlberry
- Necklace pod
- Baccharris
- White stopper
- Vaccinium
- Varnish leaf
- Viburnum rufidulum
- Wax myrtle*
- Wild coffee*
- Wild lime
- Wild olive
- Yaupon holly
- Yellow elder
- Snowberry
- Buckthorn
- Satinleaf*
- Saw palmetto*
- Leather fern

Exotic:
- Barbados cherry
- Crape myrtle
- Lantana
- Ligustrum
- Natal plum
- Orange jessamine
- Pittosporum
- Plumbago
- Podocarpus
- Powderpuff
- Silverthorn
- Surinam cherry

GROUND COVER

Native:
- Beach sunflower
- Coontie
- Coral vine
- Asparagus fern
- Boston fern*
- Gopher apple
- Indian blanket (gailardia)
- Pepperomia*
- Railroad vine
- Sea oats
- Spider lily

Exotic:
- Blue daze
- Cape honeysuckle
- Downy jasmine
- Lily turf liriope
- Mexican flame vine
- Oyster plant
- Periwinkle
- Shore juniper
- Wandering jew
- Wedelia

*The best plants for Zone One.

Zone Two

TREES

Native:
- Loblolly*
- Red bay
- Sweet bay*
- Black olive
- Green buttonwood
- Silver buttonwood
- Red cedar*
- Bald cypress*
- Dahoon holly*
- Gumbo limbo
- Mahogany
- Red maple*
- Laurel oak*
- Live oak*
- Slash pine*
- Myrsine
- Sweetgum*
- Sycamore*
- Strangler fig
- Cabbage palm
- Coconut palm*
- Paurotis palm
- Royal palm

Exotic:
- Beach acacia
- Earleaf acacia
- Bottlebrush
- Eucalyptus
- Frangipani
- Golden rain tree
- Golden shower
- Jacaranda
- Orchid Tree
- Royal poinciana
- Queen crape myrtle
- Tree of gold
- Areca palm
- Canary Island date palm
- Chinese fan palm
- Pygmy date palm
- Queen palm
- Senegal date palm
- Washingtonia palm

SHRUBS

Native:
- Cat's claw
- Gallberry*
- Lantana*
- Marlberry*
- Necklace pod
- Baccharris*
- White stopper
- Vaccinium
- Viburnum rufidulum
- Wax myrtle*
- Wild coffee*
- Wild lime
- Wild olive*
- Yaupon holly
- Buckthorn*
- Saw palmetto*
- Leather fern

Exotic:
- Barbados cherry
- Crape myrtle
- Ligustrum
- Lantana
- Natal plum
- Orange jessamine
- Pittosporum
- Plumbago
- Podocarpus
- Powderpuff
- Silverthorn
- Surinan cherry
- Viburnum

GROUND COVER

Native:
- Beach sunflower
- Coontie*
- Coral vine
- Asparagus fern
- Boston fern*
- Gopher apple
- Indian blanket (gailardia)
- Pepperomia
- Railroad vine
- Sea oats
- Spider lily

Exotic:
- Blue daze
- Cape honeysuckle
- Downy jasmine
- Lily turf liriope
- Mexican flame vine
- Oyster plant
- Shore juniper
- Spider lily
- Wandering jew
- Wedelia

*The best plants for Zone Two.

Zone Three

TREES

Native:
- Loblolly bay*
- Red bay*
- Sweet bay*
- Red cedar*
- Bald cypress*
- Dahoon holly*
- Southern magnolia*
- Red maple*
- Laurel oak*
- Live oak*
- Slash pine*
- Sweetgum*
- Sycamore
- Myrsine*
- Cabbage palm*

Exotic:
- Bottlebrush
- Eucalyptus
- Golden rain tree
- Jacaranda
- Orchid tree
- Tree of gold
- Canary Island date palm
- Chinese fan palm
- Pygmy date palm
- Queen palm
- Senaegal date palm
- Washingtonia palm

SHRUBS

Native:
- Gallberry*
- Lantana*
- Baccharris
- Vaccinium
- Viburnum rufidulum*
- Wax myrtle*
- Wild olive
- Yaupon holly*
- Saw palmetto*
- Leather fern

Exotic:
- Barbados cherry
- Crape myrtle
- Lingustrum
- Orange jessamine
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- Pittosporum
- Podocarpus
- Silverthorn
- Surinam cherry
- Viburnum

GROUND COVER

Native:
- Beach sunflower*
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- Pepperomia
- Railroad vine
- Sea oats
- Spider lily*

Exotic:
- Blue daze
- Cape honeysuckle
- Downy jasmine
- Lily turf liriope
- Mexican flame vine
- Oyster plant
- Shore juniper
- Periwinkle
- Wandering jew

*The best plants for Zone Three.

Plant Hardiness Chart

	Mature Height (in feet)	Growth Rate	Soil Moisture Requirements	Drought Resistance	Freeze Resistance	Attracts Wildlife	Salt Tolerance	Evergreen or Deciduous
Cabbage palm	25-50	S	WR	Y	Y	Y	H	E
Gumbo limbo	30-50	F	D	N	N	N	H	D
Live oak	40-50	M	WR	N	Y	Y	M	E
Laurel oak	60-80	F	WR	N	Y	Y	H	E
Sea grape	5-25	M	D	N	N	Y	H	S*
Slash pine	30-90	F	D	Y	Y	Y	M	E
Strangler fig	50-80	VF	WR	N	N	Y	ML	S*
Coontie	3	M	M	N	Y	Y	M	E
Cocoplum	10-15	M	WR	Y	N	Y	H	E
Lantana	2-10	M	WR	Y	Y	N	H	E
Leather fern	6-10	M	M	N	N	N	MH	E
Myrsine	10-25	M	M	N	N	Y	M	E
Snowberry	3-7	S	WR	Y	N	Y	MH	E
Saw palmetto	4-10	F	WR	Y	Y	Y	L	E
Spider lily	1-2	M	M	N	N	Y	M	E
Wax myrtle	10-20	M	WR	Y	Y	Y	H	E
Wild coffee	4-10	M	M	N	N	Y	H	E
Buckthorn	10-210	S	M	Y	N	Y	H	E
Satinleaf	15-30	M	WR	N	N	N	H	S*
Bald cypress	40-125	S	WR	N	Y	Y	L	D
Dahoon holly	20-40	S	W	N	N	Y	M	E
Red maple	50-60	F	WR	N	Y	Y	M	D

*semi-deciduous

Growth rate:
S-slow, M-medium, F-fast

Soil Moisture Requirements:
W-wet, M-moist, D-dry, WR-wide range

Salt tolerance:
L-low, ML-medium low, M-medium, MH-medium high, H-high

Toxic and Hazardous Plants of Southwest Florida

There are hundreds of species of plants growing in Southwest Florida that are either toxic when ingested or hazardous to the touch. These plants may be exotics or natives. They may be large or small. They may be trees, vines, shrubs, or ground covers. They may be showy enough to be chosen as attractive landscaping specimens, or they may be rather ordinary roadside weeds.

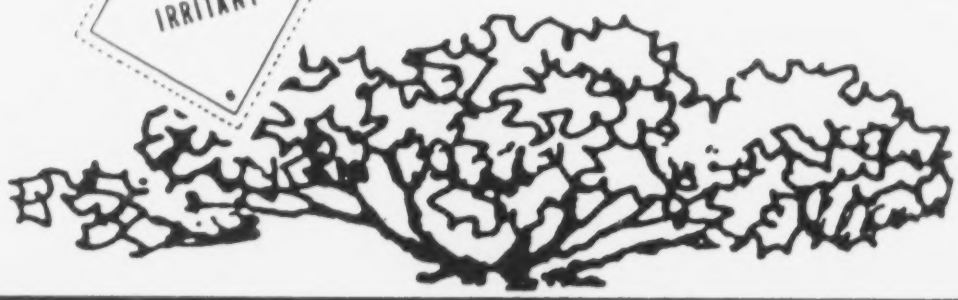
The decision to use these toxic and hazardous plants in the landscape or avoid them should be of real concern to the school landscape/playground improvement committee. It is immediately clear that these plants may cause a serious problem if a student accidently ingests a seed or leaf from one of the more dangerous toxic plants. On the other hand, if these plants, many of them native species, are growing wild throughout the area, doesn't the school have some responsibility to educate the students about the danger of these plants? Perhaps the best way to recognize and understand these hazards is by having specimens on the campus to use as teaching tools.

The decision is up to the committee and to the principal. The following list is included to guide you when selecting plants for your landscape. It is by no means a complete listing of <u>all</u> toxic and hazardous plants that may be found in your area. The number of exotic species brought into Florida for landscaping purposes is staggering. Additionally, the problem of several common names for the same species or a single common name for several different species adds confusion to the proper identification of a specimen. The best rule of thumb, as always, is, "When in doubt, check it out."

In the case of accidental poisoning contact:

POISON CONTROL CENTER
LEE MEMORIAL HOSPITAL

813-334-5287



SPECIES	TOXIC OR HAZARDOUS PARTS
Allamanda	all parts
Amaryllis	bulbs
Angel's trumpet	all parts
Aralia	sap
Atamasco-lily	bulbs
Balsam-pear (Bitter gourd)	seeds
Barbados cherry (Acerola)	new growth
Barbados nut (Physic nut)	seeds
Bellyache bush	sap, seeds
Bird pepper	fruit
Black nightshade (Nightshade, Poisonberry)	leaves, unripe fruit
Box-wood (Box tree)	?
Brazilian pepper	leaves, seeds, pollen
Broad bean (Horse bean, Fava bean, Windsor bean)	beans and pollen
Castor bean (Palma christi)	seeds
Chalice vine (Trumpet creeper)	all parts
China berry (Texas umbrella tree)	all parts
Coral plant (Coral tree, Nutmeg tree)	sap, seeds
Cowbane (Water hemlock)	all parts
Crape jasmine	all parts
Crown-of-thorns	sap, roots
Daubentonia (False poinciana)	all parts
Day jessamine	all parts
Devil's trumpet (Downy thorn apple, Metel)	all parts
Dieffenbachia (Dumb cane)	leaves, stem
Dock (Sorrel)	leaves
Duranta (Golden dew drop)	fruits
Elderberry	leaves, bark
English ivy	leaves
Foxglove	sees,leaves
Frangipani	sap
Gloriosa (Glory lily)	all parts

Green-gill (Morgan's lepiota)	all parts
Hunter's robe (Pothos)	sap
Inkberry (Pokeweed)	all parts
Jerusalem cherry	fruit
Jimson-weed (Thorn apple)	all parts
Kopsia (Ochrosia plum)	fruit
Lantana	leaves, unripe berries
Larkspur	leaves, stem, seeds
Lily-of-the-valley	leaves, fruits
Mango	sap
Melaleuca (Punk, Paper, Cajeput tree)	sap
Milk bush (Milk tree, Pencil bush/tree)	sap
Night blooming jasmine	leaves, unripe fruits
Oleander	all parts
Oyster plant	sap
Pithecellobium	sap
Plumbago	all parts
Poinsettia	all parts
Poison ivy (Poison oak)	all parts
Poisonwood (Coral sumac)	all parts
Primrose	leaves
Privet (Wax privet, Wax leaf ligustrum)	leaves, fruit
Purple queen	sap
Ragweed	leaves
Redbird cactus (Slipper flower)	all parts
Red silk-oak	flowers
Red spurge	all parts
Rosary pea (Crab-eye, Snake-eye)	seeds
Rubber vine (Purple allamanda)	all parts
Sandbox tree	seeds, sap
Spurge nettle	leaves, stem
Stinging nettle	leaves, stem
Tung-oil-tree	all parts
Wild poinsettia	sap
Yellow jasmine (Carolina jasmine)	all parts
Yellow oleander (Lucky nut)	all parts

Technical Advisory Committee

SCHOOL BOARD PERSONNEL

Mr. Donald Hawkins, Assist. Superintendent - Facilities and Transportation

Mr. James Browder, Director - Maintenance Services
Mr. Donald Horton, Supervisor

Mr. Steve Cook, Director - Facilities Planning

Mr. William Hammond, Director - Instructional Development Services and Environmental Education
Mr. Craig Hortman, Resource Teacher
Mr. Keith R. Hanson, Resource Teacher
Mr. Rick Tully, Resource Teacher

Mr. Rodney Smith, Instructor - Nursery Operations
Lee Co. Area Vocational-Technical School

PUBLIC SECTOR

Mr. David M. Jones Jr., ASLA, President
Causey, Bender, and Jones
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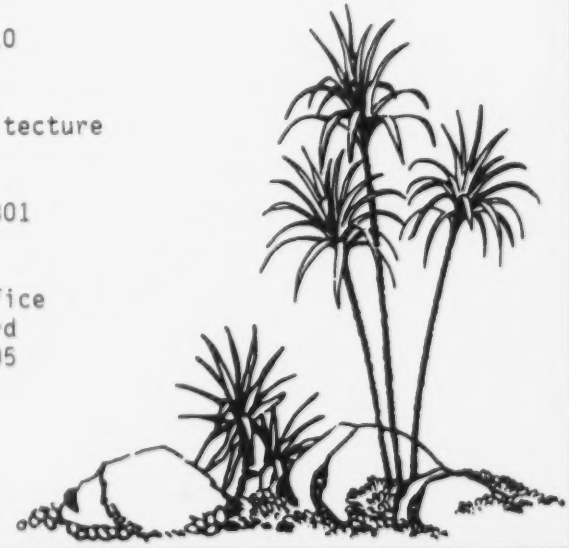
Fort Myers, Florida 33905



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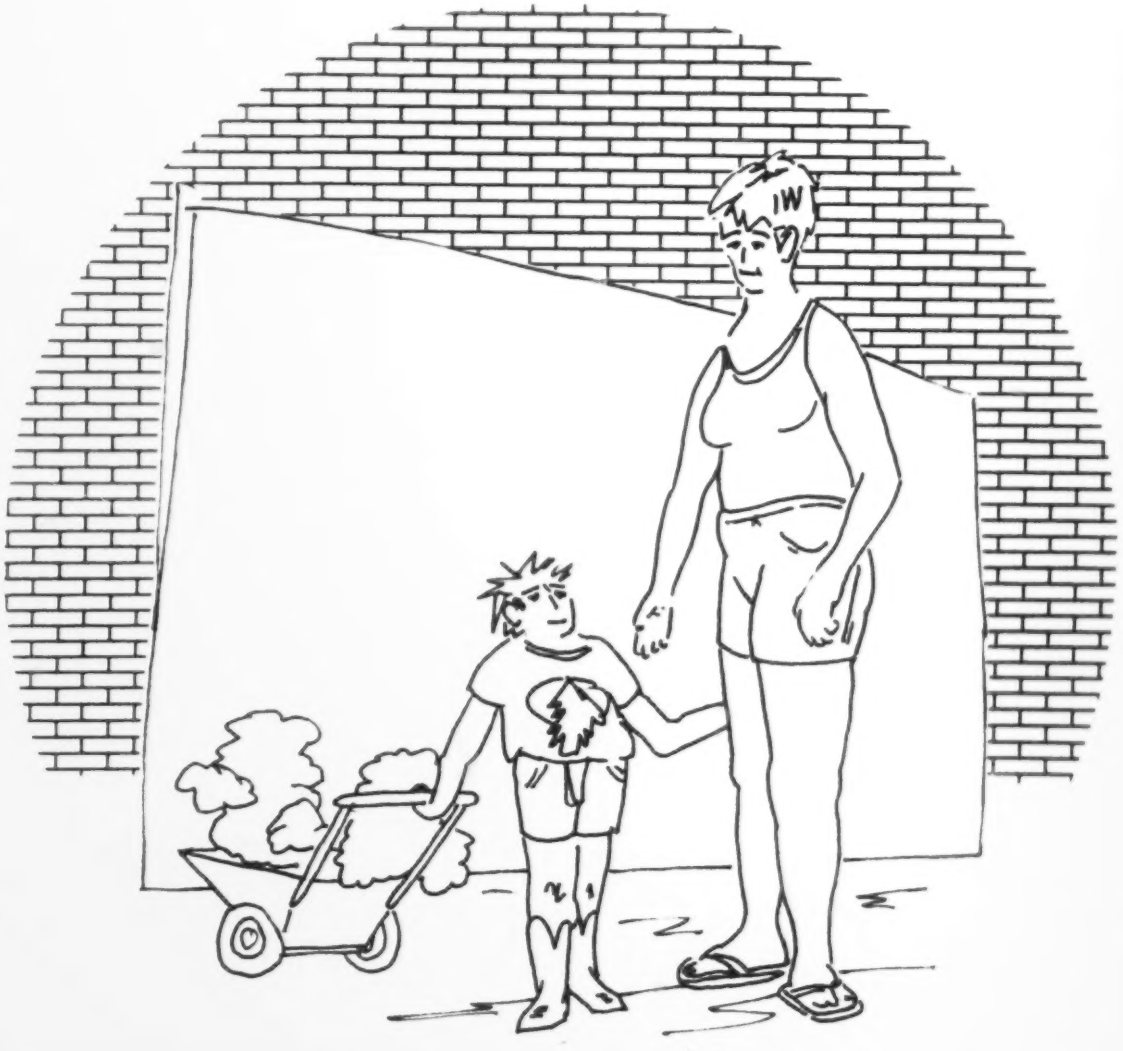
Resource Agencies

Florida Native Plant Society

Southwest Florida Native Plant Society

Lee County Garden Council

Lee County Garden Clubs



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Ponds on the School Campus

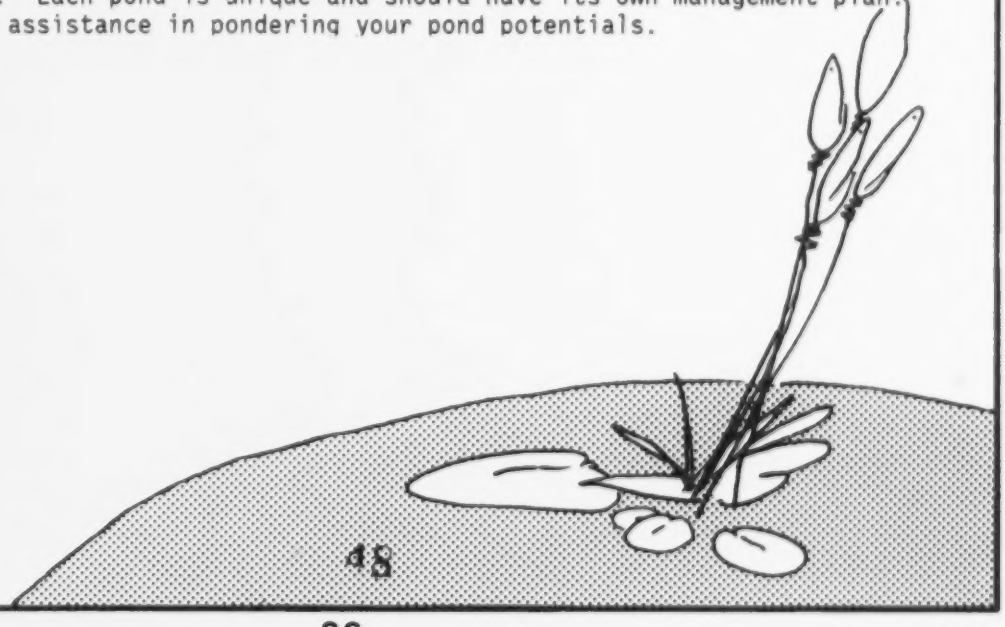
Ponds and small lakes on the campus are an amenity that many of our schools enjoy. They are not limited only to our newest schools. Staff members in some of the older school facilities are working to add a campus pond in order to enhance the instructional opportunities for students and teaching staff.

Each pond, whether it is an excavated pond to acquire fill during school construction or a ferro-cement "fish pond" in an outdoor classroom, needs careful planning and management if it is to remain a productive campus amenity.

The management priorities to consider are:

1. Student and community safety - being sure the pond is not an attractive nuisance.
2. A planning design - to assure natural ecological functioning, aesthetic appearance and low maintenance on a long term basis.
3. Management of aquatic plants on a short and long-term basis.
4. Stocking of appropriate animals/control of undesirable animals.
5. Insect management.
6. Optimizing instructional opportunities and uses.
7. Designing and constructing anciliary facilities, i.e. boardwalks, sampling docks, bridges, etc., for instruction.

The Department of IDSEE will assist you and help to facilitate the design and management planning for new ponds and for the improvement of existing ponds. Each pond is unique and should have its own management plan. Call IDSEE for assistance in pondering your pond potentials.



Use of Toxic Chemicals For School Site Improvement

One of the concerns that many people have when they install their new landscape is the potential for damage from insects. By far, the most prevalent wildlife you are likely to encounter on your schoolgrounds are insects. They outnumber all other living things on the planet by a wide margin. There are a couple of things you should know about insects before you arm yourself with sprays, foggers, and bombs preparing to do battle with these creatures.

First of all, among the tremendous variety of insects that exist in this area only a very small number are potentially damaging to your new plantings. The vast majority of insects are either beneficial or will simply have no effect on your landscape.

Secondly, it is often quite difficult to control noxious pests without having a detrimental affect on the beneficial insects as well.

So what do you do? The answer lies in proper planning long before you begin planting. Select plants that are less susceptible to insect damage. Most native species and some hardy exotic species fall into this category. They have evolved in conjunction with our native insects and have developed ways to prevent excessive damage. Often this involves a chemical substance that makes them unpalatable to potential leaf munchers.

A second benefit of native plant landscaping is that by re-establishing communities you recreate an environment that supports the naturally controlling predators (birds and other insects) that keep insect populations in check. Insect damage in balanced natural communities is rarely a problem. Where insects, or evidence of their presence do become obvious, there is often a good lesson to be taught. Such topics as food chains, predator-prey relationships, and natural pruning processes can be demonstrated with insects on your campus.

But what can you do if the problem really gets out of hand? What about those areas where you've used exotics as accent specimens? What about the inevitable problem of the vegetable garden on your schoolgrounds? When some kind of control becomes absolutely necessary, how can you achieve satisfactory results without creating a hazard to other wildlife and to the children and adults at the school?

Before you reach for the spray can, try to think of other options open to you. In your garden, for example, planting marigolds and onions will deter many pests. For caterpillar damage, try powdered <u>Bacillus thuringiensis</u>, available at most garden centers. This bacterial culture brings very effective control against caterpillar damage and is not harmful to other insects.

For those times when you have decided to apply chemical pesticides to control insect damage, keep several things in mind. These pesticides are generally quite toxic and should never be over-applied. Apply them only when there are no children and adults in the area, such as over the weekend or, preferably, during a school holiday. Use them very carefully, according to instructions on the label!

THE DREADED DUO - Fire Ants and Sandspurs

If you have a problem with fire ants on your campus, there are a number of effective chemicals available to control them. One of the most popular of these is Amdro. This granular chemical is quite toxic and should only be applied in strict accordance with label precautions. Again, schedule applications for a holiday time.

A good way to keep fire ants from becoming a problem is to keep the grassy areas of your schoolgrounds healthy through the application of fertilizer and occassional deep watering during any prolonged dry periods when the grass is in an active growth cycle.

The presence of a well-established turf will also reduce the likelihood of a second potentially serious problem for students on your schoolgrounds - sandspurs. These pesky and painful stickers, while an excellent example of seed dispersal, can be a problem if they are present in great numbers. The best solution is to keep the grass healthy and prevent them from starting in the first place. If they do come up, try carefully removing the plants, roots and all. A good technique for removing the seeds is to drag an old burlap bag over the problem areas. Collect as many of the stickers as possible, dispose of the bag, and then go to work on the individual plants. This may seem like a time consuming process, but a little time invested may prevent a small "infestation" from spreading. And, as the saying goes, "An ounce of prevention..."

For control measures to prevent damage on specific plants, call the Lee County Vo-Tech School, the Maintenance Department, or your local county extension agent.